CLAIMS

1. (Currently Amended) An infrared gas sensor with an energy supply apparatus for operating at least one radiation source with current or voltage pulses, with at least one wavelength-selecting element, with at least one detector element emitting an electrical measurement signal located between the at least one radiation source and the at least one detector, and with at least one measurement area arranged between the at least one radiation source and the detector element and disposed in the beam path, ~~with at least one wavelength-selecting element, with at least one detector element emitting an electrical measurement signal~~ and with a switching device to control the pulse duration of the current or voltage pulses, wherein the switching device has means for setting the pulse duration in such a way that the current or voltage pulse is turned off in a manner such that the pulse duration is smaller than the required to reach the maximum (τ_{MAX}) of the at least one measurement signal of the at least one detector element and such that the turn-off takes place when a specific measurement signal value is reached within the pulse duration or the turn-off occurs when a specific value of the first derivative of the measurement signal is reached within the pulse duration or the turn-off occurs when the maximum value of the first derivative of the measurement signal is reached within the pulse duration or the turn-off occurs when a specific value of the integral of the measurement signal over a time interval, starting from the turn-on time t=0 is reached within the pulse duration.

2. (Currently Amended) An infrared gas sensor according to claim 1, wherein the at least one detector element is at least one of a radiation detector, ~~and~~ a pressure transducer ~~, especially~~ and a microphone.

3. (Previously presented)An infrared gas sensor according to claim 1, wherein the current or voltage pulse is turned off after a specific time $t = \tau$, the time τ lying between the turn-on time t=0 of the current or voltage pulse and τ_{MAX}.

4-7 Cancelled

8. (Previously Presented) An infrared gas sensor according to claim 1, wherein the switching device is so operated that a pulse/pause ratio of less than 0.01 is set.

9. (Currently Amended) A method for operating an infrared gas sensor according to claim 1, wherein the current or voltage pulse is turned off in a manner such that the pulse duration is smaller than that used to reach the maximum (τ_{MAX}) of the measurement signal of the at least one detector element and such that the turn-off takes place when a specific measurement signal value is reached within the pulse duration or the turn-off occurs when a specific value of the first derivative of the measurement signal is reached within the pulse duration or the turn-off occurs when the maximum value of the first derivative of the measurement signal is reached within the pulse duration or the turn-off occurs when a specific value of the integral of the measurement signal over a time interval, starting from the turn-on time t=0 is reached within the pulse duration.

10-12 Cancelled

13. (Previously Presented) A method according to claim 9, wherein, to determine the gas concentration, the value of the first derivative of the measurement signal at a specific time $\tau_{me\beta}$, which is smaller than the pulse duration, is used.

14. (Previously Presented) A method according to claim 9, wherein, to determine the gas concentration, the value of an N-th derivative ($N > 1$) of the measurement signal at a specific time $\tau_{me\beta}$, which is smaller than the pulse duration, is used.

15. (Previously Presented) A method according to claim 9, wherein to determine the gas concentration the value of the integral of the measurement signal over a period of time starting

from the turn-on point t=0 up to a specific time $\tau_{me\beta}$, which is smaller than the pulse duration, is used.

16. (Previously Presented) A method according to claim 9, wherein to determine the gas concentration, the maximum value of the first derivative of the measurement signal is used.

17. (Currently Amended) A method according to ~~at least one of~~ claim 9, wherein, to determine the gas concentration, at least one of the times, is used at which a specific value of the measurement signal, of the N-th derivative ($N > 1$) of the measurement signal or of the integral of the measurement signal is reached.

18. (Previously Presented) A method according to claim 9, wherein, to determine the gas concentration, the time at which the maximum value of the first derivative of the measurement signal is reached, is used.

19. (Previously Presented) A method according to claim 9, wherein, to determine the gas concentration, the time of the first zero crossing of the second derivative of the measurement signal is used.

20. (Currently Amended) A method for operating an infrared gas sensor according to claim 9, to determine the concentration of a gas, comprising evaluating the results of at least two tests of the same measurement signal, said at least two tests being selected from the group consisting of:

a) ~~turning off the pulse such that the maximum value of the first derivative of the measurement signal is reached within the pulse duration;~~

~~b)~~ using the value of the measurement signal at a specific time 1_{mes}, which is smaller than the pulse duration;

b) ~~c)~~ using the value of the first derivative of the measurement signal at a specific time $\tau_{me\beta}$, which is smaller than the pulse duration;

c) ~~d)~~ using the value of an N-th derivative (N > 1) of the measurement signal at a specific time $\tau_{me\beta}$, which is smaller than the pulse duration;

d) using the value of the integral of the measurement signal over a period of time starting from the turn-on point t=0 up to a specific time $\tau_{me\beta}$, which is smaller than the pulse duration;

e) ~~using the value of an N-th derivative (n > 1) of the measurement signal at a specific time $\tau_{me\beta}$, which is smaller than the pulse duration;~~

using the maximum value of the first derivative of the measurement signal;

f) using at least one of the times, at which a specific value of the measurement signal, of the N-th derivative (N > 1) of the measurement signal or of the integral of the measurement signal;

g) using the time at which the maximum value of the first derivative of the measurement signal is reached; and

h) using the time of the first zero crossing of the second derivative of the measurement signal.